REMARKS

Claims 1-22 were pending at the time of the Final Office Action dated September 29, 2006 (the Action). In response, independent Claims 1 and 13 have been amended to generally recite the subject matter of Claims 9 and 20, respectively, and Claims 9 and 20 have been canceled. In addition, minor clarifying amendments have been made to Claims 10 and 21.

Claims 9 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gardner et al. (2000) ("Gardner") in view of U.S. Patent No. 3,626,187 to Laney ("Laney"). Applicant requests reconsideration and submits that the pending claims are patentable over the cited references for at least the reasons that follow.

Claim 1 recites an assembly for detecting gamma rays from a bulk material, the assembly defining a radiation region. The assembly includes the following:

> a radiation source adjacent the radiation region configured to irradiate the bulk material in the radiation region;
>
> a first gamma ray detector positioned adjacent the radiation region and configured to detect gamma ray events including events from gamma rays secondarily emitted by the bulk material responsive to radiation from the radiation source;
>
> a second gamma ray detector positioned adjacent the first gamma ray detector and configured to detect gamma ray events including events from gamma rays secondarily emitted by the bulk material responsive to radiation from the radiation source;
>
> a gamma ray shielding material between the first and second gamma ray detectors; and
>
> a coincidence module configured to receive signals indicating gamma ray events from each of the first and second gamma ray detectors and to identify events that are detected in coincidence in the first and the second gamma ray detectors and to <u>generate a two-dimensional plot based on the signals from the first and second gamma ray detectors</u>.

Independent Claim 13 recites a method of detecting coincidence in gamma ray detectors for analyzing a bulk material, which includes "generating a two-dimensional plot based on the signals from the first and second gamma ray detectors."

Applicant submits that neither Gardner nor Laney teacher suggested a coincidence module configured to generate a two-dimensional plot based on the signals from the first and second gamma ray detectors as recited in independent Claims 1 and 13.

The Action concedes that the assembly of Gardner is configured to generate a one-dimensional plot. The Action takes the position that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the disclosure of Gardner to generate a two-dimensional plot of the type described by column 8, lines 7-9 and **Figure 5** of Laney (page 5 of the Action). Applicant respectfully disagrees with the Action's characterization of Laney. Applicant submits that neither Gardner nor Laney discloses generating a two-dimensional plot based on signals from two detectors as recited in Claim 1 and 13, and further submits that there is no motivation to combine Gardner and Laney for at least the reasons discussed below.

Laney is directed to the detection of light scintillations, which involves a generally equal division of the light energy of the scintillation of an event between two phototubes. *See* Laney, column 1, lines 3-6. Laney discusses that **Figures 4** and **5** are schematic representations of general information, which Laney states may also be discussed in terms of spectra such as **Figure 2** for all values of the sum in **Figure 1**. See column 7, lines 70-73. Because **Figures 4** and **5** are schematic representations, **Figures 4** and **5** are not based on signals from two detectors as recited in Claims 1 and 13.

Laney discusses that the schematic representations of **Figures 4** and **5** illustrate a 45° line from the origin (X=Y) that is representative of pulse equality in a two phototubes. See column 8, lines 20-23. Laney discusses that by rejecting pulse pairs of a predetermined disparity, a substantial portion of noise background pulses previously counted along with signal pulses of substantial amplitude can be eliminated without appreciable reduction in counting efficiency for true scintillation events.

It is important to note that the techniques discussed in Laney for rejecting pulse pairs of a predetermined disparity do not apparently involve graphing the data in a two-dimensional plot. According to Laney, rejecting pulse pairs in a predetermined disparity may be done easily by a simple addition to conventional sum-discrimination equipment to produce a signal corresponding to the absolute difference between the signals and feeding the single to any conventional type of amplitude discriminator. The discriminator is connected in anti-coincidence with the conventional "window" to block the counting of pulses of excess differential. See column 2, lines 49-62.

Accordingly, Laney merely graphs schematic representations to illustrate a 45° line representative of pulse equality, and as such the graphs of Laney are not based on signals from two detectors as recited in Claims 1 and 13.

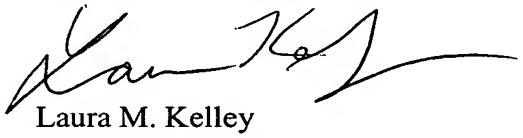
Moreover, there is no motivation to combine Gardner and Laney. Laney relates to the detection and measurement of low-level light pulses, such as scintillations produced by beta-emissions in liquid scintillation counting. See Laney, column 1, lines 3-6. Laney discusses that the basic mechanism of pulse-production involves a generally equal division of the light energy of the scintillation between the two phototubes. See Laney column 2, lines 31-34. Therefore, Laney is concerned with the 45° line from the origin shown schematically in **Figure 5**, which represents pulse equality between the phototubes.

In contrast, Gardner discusses a system in which prompt gamma rays are emitted when a ^{252}Cf neutron source causes a capture reaction to occur in the sample box of **Figure 5a**. Conventional one-dimensional gamma ray spectra are shown, for example, in **Figure 6** of Gardner. Gardner does not discuss pulse-production or light scintillation, which according to Laney results in a generally equal division of the light energy of the scintillation between two phototubes (*i.e.*, pulse equality). Because Gardner is not concerned with pulse equality, it is unclear how the 45° line shown in **Figure 5** of Laney could be applied to the coincidence spectrum of Gardner.

For at least these reasons, Claims 1 and 13 are patentable and not rendered obvious by Gardner or Laney. Claims 2-8, 10-12, 14-19 and 21-23 are patentable a least per the patentability of the claims from which they depend. Accordingly, Applicant requests that the rejections under Section 103 be withdrawn.

In view of the foregoing amendment and remarks, the applicant respectfully requests that all outstanding rejections to the claims be withdrawn and that a Notice of Allowance be issued in due course.

Respectfully submitted,



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